# West Nile Virus in Utah

Utah reported its first West Nile virus (WNV) activity in August 2003. WNV surveillance in 2003 consisted of testing mosquitoes, sentinel chickens, horses, dead birds, and humans. WNV was first detected in Utah in sentinel chickens, horses, mosquitoes, and dead birds before any human activity was detected (see Figure 1). The detection of WNV led to mosquito control measures and more intense public education. These measures reduced human exposure to WNV. One Utah resident acquired WNV infection in Uintah County in 2003.

Nine Utah counties (Carbon, Duchesne, Emery, Grand, Millard, Sanpete, Uintah, Utah, and Wayne) found WNV by the end of the 2003 mosquito season (see Figure 2). In these counties, WNV was detected as follows:

Carbon: Sentinel chickens (4)
Duchesne: Horses (3), sentinel chickens (1)
Emery: Horses (8), sentinel chickens (4)
Grand: Crow (1), magpie (1)
Millard: Horse (4)
Sanpete: Horse (2)
Uintah: Mosquitoes (1 batch), horses (15), human (1)
Utah: Mosquitoes (1 batch)
Wayne: Horse (2)

WNV has spread considerably since its first detection in New York City in 1999. In 2003, 44 of the 48 contiguous United States reported some form of activity, including 9,377 human cases, 4,434 equine cases, 11,613 dead birds, and 7,856 positive mosquito pools. States that did not report local WNV activity in 2003 include Washington, Oregon, Idaho, Nevada, Hawaii, and Alaska.

In the U.S., most states experience an increase in WNV activity the year after its first detection. Utah expects WNV will return in 2004 and may have a greater impact on humans, birds, and animals. Public health officials and partner agencies are planning and preparing for such a situation. This spring, WNV monitoring and testing will resume with testing “sentinel” chickens, mosquitoes, horses, and dead birds reported by the public. As always, clinicians and laboratories that detect and report the virus infection in people will be an important part of WNV tracking.

WNV can be a very serious disease, which can result in death. Even in areas affected by WNV, most mosquitoes do not carry the virus so the risk of being infected from a single mosquito bite is very low. Infected mosquitoes do not look or behave differently from mosquitoes that are not infected. If a person is bitten by an infected mosquito and becomes infected, 4 out of 5 people will not develop any symptoms of the disease, and only about 1 in 150 will become seriously ill. However, it's still important to prevent mosquito bites since WNV can cause serious illness, especially in persons over 50 years of age or with weak immune systems.

While WNV is transmitted primarily through the bite of a mosquito, in 2002 several other minor routes of transmission were identified (i.e., cases infected through these routes are rare). Transmission of the virus was identified in incidents involving blood

transfusions, organ transplants, mother-to-child (breast feeding and intrauterine), and laboratory needle sticks. These routes of transmission are being closely monitored in 2003 and 2004 to better characterize the risk from these routes for the general population.

Diagnosis of WNV is made by observation of clinical symptoms that are consistent with infection (determined by a health care provider) and a laboratory test showing antibodies to the virus. Currently, there is no human vaccine available and no recommended drug treatment (only symptom-specific treatment).

West Nile disease manifests in humans in 2 major forms: West Nile fever and West Nile central nervous system disease. People over the age of 50 or with weakened immune systems are at higher risk for the more severe form of the disease. However, most people that become infected (about 80%) will never experience symptoms (see Figure 3).

Those that do experience symptoms usually do so within 2-15 days after exposure to the virus through the bite of a mosquito. WNV is seasonal in its incidence, with the peak season matching that of the mosquito season. Peak human transmission occurs from the end of July through early September, depending on latitude (see Figure 4 – Centers for Disease Control and Prevention).

WNV causes a flu-like illness, West Nile fever, in about 20% of those infected. This illness typically lasts 2-7 days and causes headache, fever, nausea, vomiting, weakness, and sometimes a skin rash.

Acute flaccid paralysis (AFP), which causes polio-like symptoms, is another effect of WNV infection. Risk factors for AFP have not been identified and this illness may occur independently of any central nervous system symptoms. Most people who acquire AFP do not recover full use of their limbs.

West Nile central nervous system disease (meningitis or encephalitis) occurs in less than 1% of those that are infected and is much more serious, usually requiring hospitalization. Fever, headache, neck stiffness, and nausea are symptoms of West Nile meningitis (where the linings of the brain and spinal chord are involved). Those that also involve the brain tissue (encephalitis) include the above symptoms plus altered mental status. About 10% of central nervous system cases are fatal and many other patients never fully recover from their illness. Therefore, the goal of our WNV public health surveillance system is to prevent human infection.

Since people can become infected with WNV through mosquito bites, individuals should protect themselves. Utahn's can reduce their risk through these simple steps:

- Protect from dusk to dawn. That is when mosquitoes that carry the virus are most active, so take precautions to prevent mosquito bites.

- Use repellent with DEET (N,N-diethyl-m-toluamide), following the label instructions carefully. For adults, use repellents containing DEET at 30-35% concentration. For children 2 months to 12 years, use repellents containing less than 30% DEET. Do not use on children under the age of 2 months and do not apply to hands and feet of children.

- Take cover.  Wear light-colored, long pants and long-sleeved shirts.  Use mosquito netting when sleeping outdoors or in an unscreened structure and to protect small babies any time.
- Make sure screen doors and window screens are in good condition.  Small holes are large enough to allow mosquitoes to enter.

Around your home and property, eliminate places for mosquitoes to reproduce:

- Eliminate standing water sources around housing areas, such as water in old tires, cans, poorly kept swimming pools, toys, wheelbarrows, etc.

- Water that is kept outside for a reason, such as pet water dishes, birdbaths, etc., should be changed at least once every 2-3 days.

- Clean rain gutters at least once a year.

- Aerate ornamental ponds or contact your local mosquito abatement district about pond treatment.

- Maintain swimming pools properly or drain them.

If you have questions regarding WNV, please visit our website www.health.utah.gov/wnv or contact your local health department or the Utah Department of Health (UDOH) Office of Epidemiology at 801-538-6191.

The UDOH would like to thank and acknowledge our partners, the Utah Mosquito Abatement Association and the local mosquito abatement districts, the Utah Department of Agriculture and Food, the 12 Utah local health departments, the Utah Division of Wildlife Resources and other wildlife agencies, health care professionals, laboratories, veterinarians, Utah's zoos and aviaries, and the Centers for Disease Control and Prevention, for helping with the tracking and monitoring of WNV in Utah.

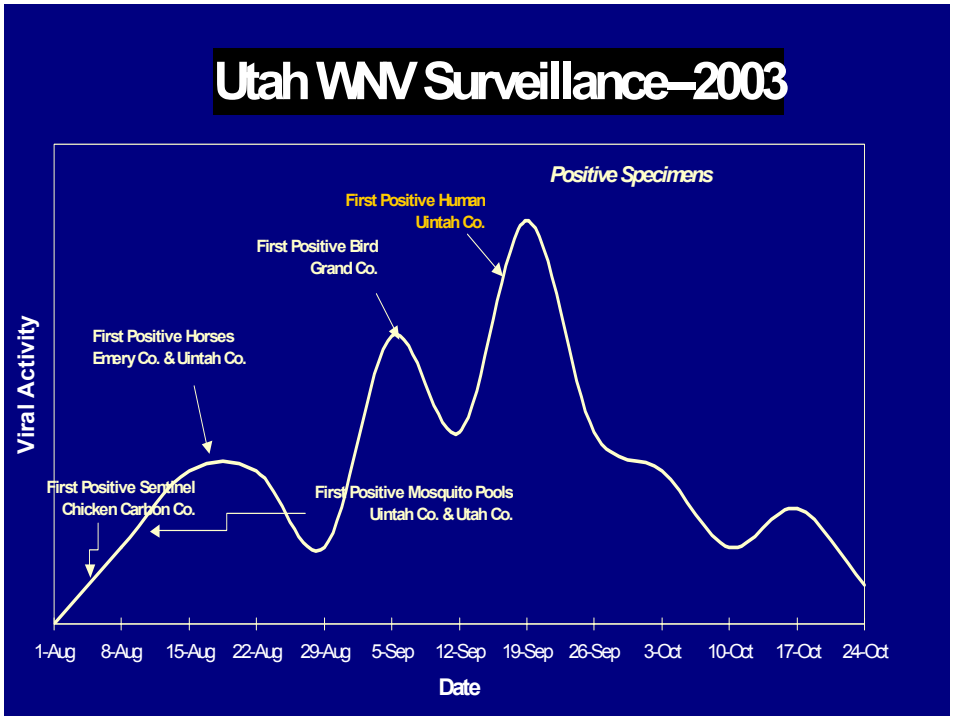
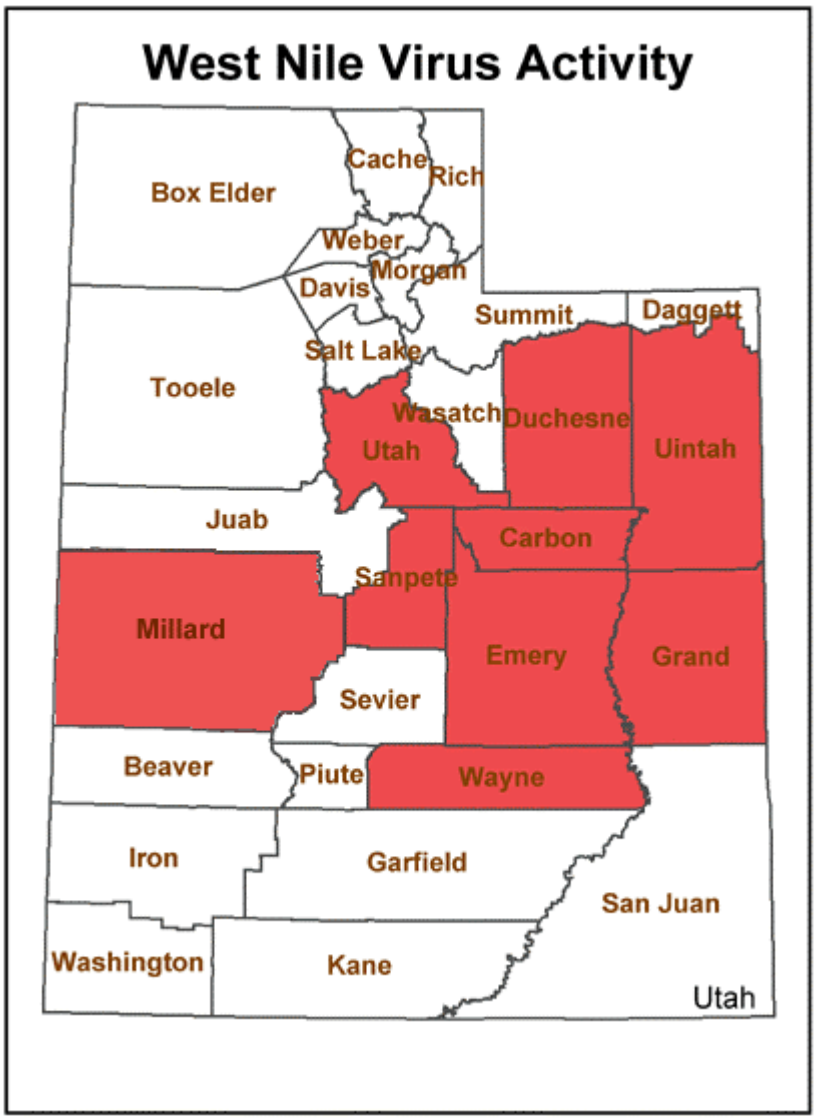

Utah WNV Surveillance–2003
Positive Specimens
First Positive Human
Uintah Co.
First Positive Bird
Grand Co.
First Positive Horses
Emery Co. & Uintah Co.
First Positive Sentinel
Chicken Carbon Co.
First Positive Mosquito Pools
Uintah Co. & Utah Co.
Viral Activity
1-Aug
8-Aug
15-Aug
22-Aug
29-Aug
5-Sep
12-Sep
19-Sep
26-Sep
3-Oct
10-Oct
17-Oct
24-Oct
Date

**Figure 1**

**Figure 2: West Nile Virus Activity 2003**



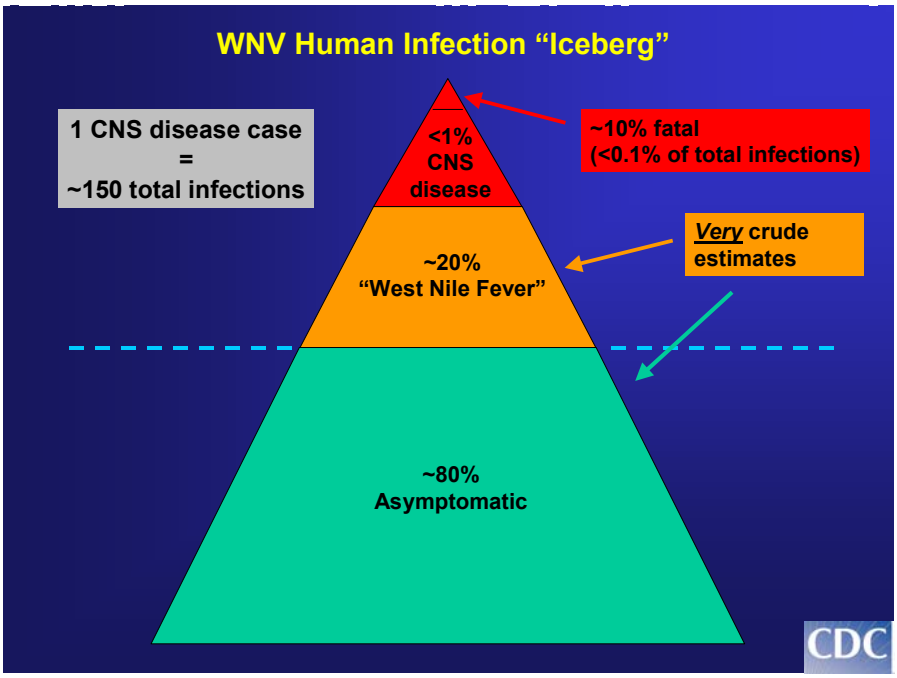



Figure 3

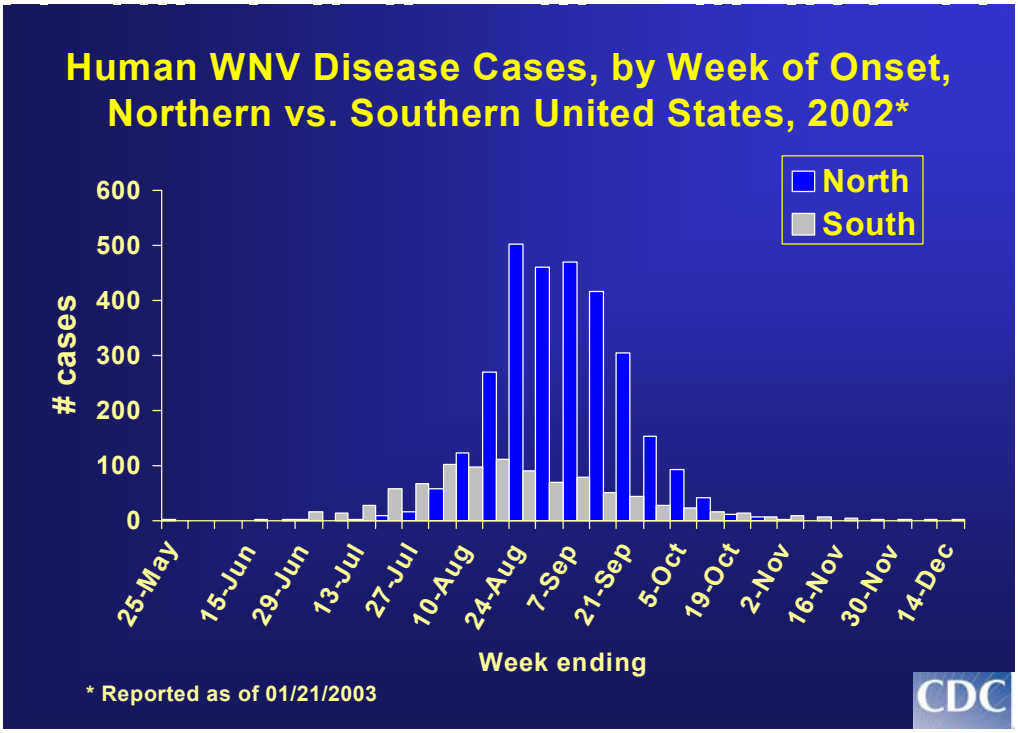



Figure 4